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Montana Soil Health Strategic Action Plan

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Introduction

In early 2020, a Soil Health Strategy Action Team (SHSAT) was convened by Natural Resources Conservation Service (NRCS) leadership in Montana. Thirteen team members from diverse geographic areas of the state representing the disciplines of range, agronomy, soils, engineering, biology, and public affairs came together with the task of developing a soil health strategy and vision tailored to meet the needs of NRCS Montana. The expected outcome of this effort was to elevate delivery of Soil Health Principles across Montana in conjunction with program delivery through Montana Focused Conservation.

Purpose Statement

By specifying the following goals and subsidiary action objectives, the purpose of this Montana Soil Health Strategic Action Plan is to provide a path toward elevated delivery of soil health principles by NRCS MT, resulting in healthy, functioning soil as the foundation for all working lands in Montana.

Definitions

Montana Focused Conservation

Montana Focused Conservation (MFC) is a strategic approach to delivering Farm Bill financial assistance programs by implementing conservation projects proposed within investment-ready Targeted Implementation Plans (TIPs). TIPs are considered investment-ready when the anticipated implementation outcome represents a defined and measurable positive effect for natural resources conservation. TIPs generally focus on a specific geographic location (i.e. watershed) where multiple landowners are ready, willing, and able to complete projects addressing the same resource concerns.

Soil

Soil is a dynamic, self-organizing, living ecological system comprised of a porous medium that has developed in the uppermost layer of Earth's crust. Soil is one of the principal substrata of life on Earth, serving as a reservoir of water and nutrients, as a medium for the filtration and breakdown of injurious wastes, and as a participant in the cycling of carbon and other elements through the global ecosystem. It has evolved through weathering processes driven by biological, climatic, geologic, and topographic influences. (Adapted from Sposito, 2020)

Soil Health

Soil health, also referred to as soil quality, is defined as the continued capacity of soil to function as a vital living ecosystem that sustains plants, animals, and humans. (USDA-NRCS, 2020)

Soil Health Principles

Minimize disturbance, maximize diversity, maximize living roots, maximize cover, add livestock. (Adapted from USDA-NRCS, 2020)



Goals and Action Objectives

Goal 1: Demonstrate Agency-wide commitment by integrating the soil health principles into all NRCS Montana functions.

NRCS in Montana is committed to integrating soil health principles across all disciplines and into all Agency functions.

Action Objective 1.1: Confirmation by NRCS Montana leadership that elevating delivery of the soil health principles is a national and state priority of NRCS

Agency leadership in Montana will demonstrate the importance of this priority through word and action, internally and externally.

Messaging from leadership will be coordinated for consistency, be repeated often, and emphasize that the elevated delivery of soil health principles:

- Is a priority of the NRCS Chief and the State Conservationist (STC) for Montana;
- Will be accomplished in an integrated manner with delivery of NRCS assistance;
- Transcends technical disciplines; and
- Directly and fundamentally influences the approaches taken to address natural resource concerns identified in Montana, including through MFC.

Priority will be emphasized internally and externally by the STC through the State Leadership Team (SLT) at venues such as:

- Internal meetings at all Agency levels, including state leadership team, all-employee, area, and staff meetings;
- Montana Association of Conservation Districts (MACD) Annual Meeting; and
- Partnership meetings.

In addition to consistent messaging, rotational SLT engagement in events and field activities is essential so leaders:

- Provide a physical presence that internally and externally reinforces Agency commitment to the soil health priority;
- Receive relevant technical information to maintain or improve understanding of soil health principles and their fundamental applicability to delivery of NRCS service in Montana; and
- Gain broader insight into opportunities and challenges facing the Agency as it seeks to accomplish required outcomes.

Action Objective 1.2: Establish a State Soil Health Specialist position

To elevate delivery of the soil health principles throughout Montana, undivided attention will be allocated to set intent into action. In acknowledgement of this, a full-time State Soil Health Specialist position (Permanent, Series 457) will be filled on the State Soil Scientist's staff, duty station Bozeman. Anticipated duties include the following as well as other items to be determined:

- Executing the adopted Soil Health Strategic Action Plan under the advisement of the Soil Health Action Committee;
- Ensuring NRCS Montana is operating at the forefront of soil health science and practice;



- Establishing and maintaining internal and external technical relationships;
- Collaborating with state technical staff, Plant Materials Center (PMC) staff, and the Montana PMC Committee, to support PMC soil health activities;
- Exploring establishment of a soil health learning center;
- Leading and coordinating internal and external trainings;
- Leading and/or supporting NRCS field trials;
- Supporting individual area and field office efforts to elevate delivery of soil health principles;
- Leading the ongoing internal effort required to incorporate soil health principles into delivery of all aspects of Agency assistance, both technical and programmatic;
- Assisting field offices with local workshops;
- Functioning as the NRCS primary point of contact for the Montana Soil Health Symposium; and
- Collaborating with partners.

At minimum, a successful Soil Health Specialist should be an employee who has:

- Established technical expertise in the science and practice of soil health principles, including their relationship to other aspects of natural resources conservation;
- Familiarity working with common agricultural operations within the geographic and climatic context of Montana;
- Willingness to explore and promote innovative agricultural techniques;
- Education, training, and experience required to understand the fundamental connection between soil health principles and recognized NRCS resource concerns;
- Experience with delivery processes of NRCS technical and financial assistance across disciplines;
- Success in creating and/or maintaining a partnership network that works together to achieve long-term goals; and
- Communication skills to successfully transfer technical information orally and in writing to internal and external audiences including employees at all levels, private landowners, non-governmental organizations, and others.

Action Objective 1.3: Establish and assign accountability to a Soil Health Action Committee

The SHSAT, a one-time strategy development committee will be dissolved. A standing Soil Health Action Committee (SHAC) reporting to the SLT and accountable for accomplishing soil health action objectives outlined in this document will be established. To encourage stability in approach, SHAC membership will not rotate on a fixed schedule, but rather will reflect the continued individual desire of each member to serve with the support of their supervisory line.

SHAC membership will be targeted to include:

- Two representatives from each area selected at the discretion of each Area Conservationist (AC);
- The State Soil Health Specialist, Agronomist, Forester, Plant Materials Specialist, Range Management Specialist, and Resource Conservationist;
- A representative from the state engineering team and the public affairs team; and
- Other staff as needed, i.e.: programs, partnerships, etc.



The SHAC will be tasked with ensuring the fulfillment of the adopted Soil Health Strategic Action Plan by:

- Annually developing and seeking SLT approval of a proposed plan of work to accomplish specific Strategic Action Plan objectives, including:
 - Scheduled activities, workshops, tours, etc. and
 - Tasks and timelines to complete annual plan of work.
- Estimating budget requirements to complete annual plan of work;
- Annually reviewing and updating the Strategic Action Plan; and
- Reporting collectively to the SLT through quarterly one-pager updates and one overall annual report.

Following SLT approval of an annual plan of work, the State Soil Health Specialist will be primarily responsible for execution of the plan in coordination with and under advisement from the rest of the SHAC. In addition, the SHAC members will make a concerted effort to support group learning and communication by reporting on soil health projects, events, successes, and failures to both field and leadership colleagues.

To foster effective generation of ideas and to maintain focus, energy, and accountability, the SHAC will:

- Meet once annually in-person; and
- Meet quarterly remotely.

SHAC meetings will be guided by a trained facilitator from outside the group when available.

Action Objective 1.4: Formally incorporate soil health principles into delivery of Agency assistance

Elevated delivery of the soil health principles by NRCS in Montana requires a specific effort to integrate them into existing processes, products, and tools utilized within the Agency when providing technical and financial assistance:

- Establish a state Field Office Technical Guide committee. As a member, the State Soil Health Specialist will help to identify high priority technical and financial assistance opportunities for soil health principle integration;
- As conservation practice standards, specifications, implementation requirements, payment scenarios, and enhancements are reviewed, discipline leads will collaborate with the Soil Health Specialist to incorporate soil health principles and to address ideas or concerns from field staff;
- Develop, advance, and maintain technical tools to assist planners in assessing and solving fundamental causes of resource concerns rather than symptoms, using soil health principles, in the effective delivery of technical and financial assistance; and
- Review effectiveness of integration by field staff during appraisals, spot checks, and evaluation of applicable TIP outcomes.

Action Objective 1.5: Prioritize soil health training for NRCS Montana staff

Elevating delivery of soil health principles requires that NRCS employees in Montana receive ongoing soil health training. The main purpose of this action objective is to encourage development of a practical, relevant knowledge base across all disciplines, so staff better



understand how soil health principles fundamentally apply to the resolution of many natural resource concerns. Effort should be initiated as a Year 1 priority for the Soil Health Specialist to identify and centrally catalog specific training opportunities representing good value for the Agency.

Training will be:

- Encouraged across all disciplines, geographic areas, and experience levels;
- Encouraged at more advanced levels for those who already have attended soil health training;
- Provided to employees with an associated expectation of knowledge transfer to coworkers and producers upon completion;
- Inclusive of a multitude of formats, including courses, conferences, on-line videos, field days, etc.; and
- Incorporated into all aspects of foundational, Montana-delivered technical courses.

Action Objective 1.6: Collaborate with the SRC, BPMC Manager, and Montana PMC Committee to promote the integration of soil health principles into PMC operations

To be consistent with its mission and vision, NRCS will pursue opportunities to integrate application of soil health principles into PMC activities.

To accomplish this:

- Explore funding opportunities to supply a no-till plot drill for PMC use in day-to-day operations, field plantings and soil health-specific activities. This is a critical piece of equipment to incorporate soil health principles, saving labor and money.
- Support and encourage the practical integration of soil health principles into day-to-day PMC activities, including those of a routine nature or supporting other goals as allowed by available PMC acreage and the PMC Business Plan;
- PMC will support the national and state NRCS soil health priorities, including allocating acreage dedicated to application of soil health principles in field trials and demonstrations;
- Provide the expertise of the State Soil Health Specialist in support of PMC soil health activities; and
- Pursue opportunities to engage the SHAC during PMC Business Plan development with respect to soil health activities.

Action Objective 1.7: Explore establishment of a Montana soil health learning center and concurrently seek a network of additional sites to provide training, trial, and demonstration opportunities across all land uses

NRCS will explore the use of acreage and facilities for establishment of a soil health learning center dedicated to elevating delivery of soil health principles in Montana by providing a consistent, long-term, brick-and-mortar presence as a training, field trial, and demonstration site.

Additionally, to provide soil health training, trial, and demonstration opportunities throughout Montana, NRCS will explore partnerships with facilities representing all land uses across the state.



Action Objective 1.8: Utilize expertise in the Soil and Plant Science Division (SPSD) MLRA Soil Survey Offices to enhance soil health delivery in Montana

Montana is fortunate to have 4 MLRA Soil Survey Offices located throughout the state in Dillon, Missoula, Havre, and Miles City. The staff in those offices have expertise in soil-plant relationships specific to that soil survey area. They are ready, willing, and able to be a part of Montana's soil health delivery team. Specific ways SPSP staff might contribute as invited/requested may include:

- Participation in educational/outreach events. Often, Soil Survey staff can provide specific insight on common local soil series and recommendations on targeting soil health management strategy by soil type;
- Service on area/and or statewide soil health teams; and
- Conducting Dynamic Soil Property (DSP) projects. DSPs are soil properties that change with natural and anthropogenic disturbances and stressors including agricultural and wildland management. These soil sampling projects can provide locally relevant data on the effect of various soil health management practices. Currently, there is a soil health DSP project in progress being coordinated by the Miles City Soil Survey Office. Similar projects could be initiated in other areas of the state.

Goal 2: Implement soil health principles and promote soil health innovations on all land uses according to best science and practice

Successful and widespread, yet targeted, implementation of soil health principles on all land uses is the ultimate expression of elevated delivery by NRCS. Implementing soil health principles according to best science and practice gives customers assurance that NRCS assistance is technically sound, responsibly delivered, and provides the greatest opportunity for achieving desired conservation objectives.

Action Objective 2.1: Support and develop soil health demonstration projects

Continuing to build Agency expertise by developing the body of relevant, scientifically supported work is essential to elevate delivery of soil health principles in Montana. This is a long-term process and will include support for both internal and external scientifically based demonstration efforts. This process involves:

- Identifying and cataloging existing demonstration projects relevant to delivery of soil health principles in Montana;
- Identifying knowledge gaps that warrant development of research or demonstration projects;
- Prioritizing implementation of demonstration projects and encouraging Conservation Innovation Grant proposals;
- Partnering with research-driven organizations such as Montana State University and Agricultural Research Service to support relevant, established research projects and to communicate new project ideas based on identification of need;
- Compiling and evaluating relevant Targeted Implementation Plan (TIP) outcomes;
- Performing economic analyses of soil health principle implementation;
- Clearly communicating results internally and externally with staff, partners and producers (ex: Bozeman Area Soil Health one-pagers); and
- Incorporating suitably vetted results into official NRCS guidance and reference material.



Action Objective 2.2: Promote implementation of soil health principles through MFC

Within the framework of MFC, NRCS Montana will promote soil health principles to address underlying causes, rather than symptoms, of resource concerns on all land uses throughout Montana. To accomplish this:

- Develop baseline assessments of priority soil health resource concerns across Montana to define the scope of conservation opportunity and determine the outcomes realized through MFC efforts (i.e., how we are moving the needle);
- Encourage NRCS planning assistance toward TIPs that emphasize purposeful implementation of soil health principles to resolve fundamental problems underlying identified resource concerns;
- Annually review programmatic payment rates to promote implementation of underutilized conservation practices that are known to improve soil health; and
- Encourage opportunities within NRCS programs that deliver soil health principles in innovative ways.

Action Objective 2.3: Develop readily accessible technical guidance to expedite delivery of soil health principles by NRCS staff at all Agency levels

Provide momentum for implementation of soil health principles by packaging and disseminating technical guidance in a manner that enables rapid delivery throughout the state, including:

- Identification of top resource concerns in Montana associated with poor soil health and their most common, fundamental causes;
- Explanations and examples of soil health principle implementation on each land use;
- Identification of technical and outreach strategies, including highlighting NRCS practices and enhancements that have proven effective in fundamentally addressing resource concerns; and
- Exploring opportunities to invest in soil health assessment tools.

Goal 3: Develop and strengthen partnerships to increase the adoption of soil health principles on all land uses

Partnerships play an important role in delivery of NRCS assistance and will be strategically pursued to elevate delivery of soil health principles in Montana.

Action Objective 3.1: Strategically prioritize soil health-focused partnerships in Montana to form the backbone of a “Soil Health Coalition”

- Formulate the coalition model;
- The SHAC will provide suggested deliverables for the coalition to address and identify potential contributing partners;
- Develop and execute soil health-focused partnership meetings throughout the state; and
- Support a grassroots-driven soil health training in each area, potentially involving:
 - Identifying education-oriented partners and consultants to host and/or deliver trainings for the advancement of soil health on the landscape (Examples of potential courses are “Ranching for Profit”, “Holistic Management”, etc.);
 - Developing a base curriculum in cooperation with these partners and in consultation with producers engaged in diverse agricultural enterprises;
 - Locally adapting the base curriculum as needed to address implementation of soil health principles on all land uses; and



- Delivering training across Montana in cooperation with identified partners and with input from local producers.

Goal 4: Provide education, communication, and outreach to employees, producers, and partners for advancing knowledge and adoption of soil health principles

NRCS will be a leader in efforts to deliver relevant, science-based soil health information into the hands of present and future practitioners.

Action Objective 4.1: Promote adoption of soil health principles through NRCS Montana communications by:

- Working with soil health practitioners and researchers to identify and publicize field trial results through text, photos, and interactive maps developed at a technical level to appeal to landowners of varying expertise;
- Highlighting producer experiences through appropriate text and photos that reflect successful implementation of soil health principles on all land uses in Montana;
- Making use of all media formats to encourage effective communication with diverse audiences; and
- Promoting success stories elevated by the SHAC from across the state.

Action Objective 4.2: Annually convene a Montana Soil Health Symposium

The 2019 Montana Soil Health Symposium proved to be an excellent forum for the sharing of technical information by some of the most respected names in earth sciences, agriculture, and natural resources conservation to a capacity audience. Further success is built by:

- Annually convening similar symposia as flagship soil health events in Montana for at least the next 5 years to encourage broad networking among practitioners, producers, researchers, and partners representing the multitude of land uses and contexts found within Montana;
- Selecting larger symposia venues to accommodate demand;
- Annually evaluating and selecting NRCS staff for attendance;
- Pursuing partnerships with organizations and partners to assist with and support the Montana Soil Health Symposium; and
- Coordinating and communicating annual symposium themes throughout all NRCS-involved trainings and workshops to maximize extent of content delivery.

Action Objective 4.3: Support outreach to local schools and other youth organizations to raise soil health awareness and provide training for tomorrow's producers, scientists, and conservationists

The understanding and adoption of soil health principles by future generations requires a training investment today. Additionally, younger members of farm and ranch families can be influential in operational decision-making. For these reasons, NRCS will support interactive soil health outreach and training to young people by:

- Engaging locally and statewide with youth organizations such as FFA, 4-H, and others;
- Partnering with Montana Farm Bureau Federation, Montana Department of Agriculture, and Montana Stockgrowers in support of their respective Young Farmer/Rancher and Young Ag Couples programs;



- Assisting with incorporation of soil health principles into the Montana Range Days curriculum and maintenance of the soil health curriculum for Youth Range Camp;
- Seeking opportunities to bring the science and practice of soil health into local classrooms; and
- Exploring partnerships with established youth education programs such as the Envirothon, MSU Extension's Montana Natural Resource Youth Camp, and Montana Ag in the Classroom's many opportunities (Ag Literacy curriculum, projects, Montana Student Ag Mag, and science fair ideas).

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